Outside of the context of the local university, professional societies and journals are the major institutions that provide disciplinary identity. Given the importance of publication both in establishing a scientist's career and in disseminating results of research, the availability of journals influences the direction of a field. They determine not only what topics of research can most readily be published, but also what methods investigators can employ in investigating those topics. An important step in developing a new area of research and a research community that will carry out the research is the creation of new journals that will publish the results. In many cases, professional societies manage journals. Societies typically also hold regular meetings that provide a context in which scientists meet formally and informally to share results and formulate directions for future research. Although talks at professional society meetings often receive less credit in terms of professional advancement, they are favored vehicles for rapid communication and provide important opportunities for personal interaction.

Beyond formal institutions, sociologists have also focused on informal networks of scientists. Derek de Solla Price (1961; see also Crane, 1972; Chubin, 1982) coined the concept *invisible college* for groups of researchers who are in regular communication and share a common conceptual framework, problem focus, and set of techniques for dealing with a problem, although they may disagree on empirical claims or proposed theories. Sociologists identify such networks using such techniques as tracking citations and identifying clusters (Garfield, 1979). A variety of quantitative techniques have been developed for identifying and graphing social networks (Wasserman & Faust, 1994). A recent approach focuses on collaboration networks characterized in terms of coauthorship of papers (if two scientists have coauthored a paper, they are directly linked; if two scientists have not coauthored a paper but have each coauthored a paper with another scientist they are linked through that scientist, etc.). These networks have been shown to constitute structures known as *small worlds* in which randomly chosen pairs of scientists are typically separated by only a short path of intermediate collaborators (Newman, 2001). Such networks can also be studied more qualitatively and in detail to reveal the interactions that shape the direction of science. Jean-Paul Gaudillière (1996), for example, studied collaborative networks of scientists in France in the 1960s as specimens that could be revealing of the relationship between biochemistry and the emerging molecular biology.

As it turns out, despite the frequent conflict between theorists pursuing cognitive and social accounts of science, the various cognitive and social criteria for delineating units in science tend to converge on the same units. That is, institutional structures, methods of inquiry, domains of inquiry, and